

This listing of claims will replace all prior versions of claims in the application.

Claim 1. (previously presented) A sintered ceramic igniter element comprising a conductive zone, a power booster zone, and a hot zone, the booster zone having a PTCR and a resistivity greater than the conductive zone and less than the hot zone, the hot zone having a resistivity greater than the booster zone, wherein the hot zone path length is 2 cm or less and the igniter has a time-to-temperature value of 3 seconds or less.

Claim 2. (original) An igniter element of claim 1 wherein the resistance of the booster zone permits i) current flow to the igniter hot zone and ii) resistance heating of the booster region during use of the igniter.

Claim 3. (original) An igniter element of claim 1 or 2 wherein the resistance of the booster zone increases during application of current through the igniter and heating of the booster zone.

Claim 4. (previously presented) An igniter element of claim 1 wherein the igniter comprises in sequence the conductive zone, the booster zone and the hot zone.

Claim 5. (previously presented) An igniter of claim 1 wherein the three zones differ in operational temperature during use of the igniter.

Claim 6. (original) An igniter element of claim 5 wherein the hot zone has a higher operational temperature than the booster zone, and the booster zone has a higher operational temperature than the conductive zone.

Claim 7. (previously presented) An igniter element of claim 1 wherein the booster operational temperature is about 200°C higher than the operational temperature of the conductive zone.

Claim 8. (original) An igniter element of claim 6 or 7 wherein the booster operational temperature is at least about 100°C less than the operational temperature of the hot zone.

Claim 9. (previously presented) An igniter element of claim 1 wherein the room temperature resistance of the conductor zone is less than about 50 percent of the room temperature resistance of the booster zone.

Claim 10. (previously presented) An igniter element of claim 1 wherein the room temperature resistance of the booster zone is less than about 70 percent of the room temperature resistance of the hot zone.

Claim 11. (previously presented) An igniter element of claim 1 wherein the operational temperature resistivity of the booster zone is at least about 50 percent greater than the operational temperature resistivity of the hot zone.

Claims 12-13. (cancelled)

Claim 14. (previously presented) A method of igniting gaseous fuel, comprising applying an electric current across an igniter an igniter of claim 1.

Claim 15. (original) A method of claim 14 wherein the current has a nominal voltage of 6, 8, 10, 12, 24, 120, 220, 230 and 240 volts.

Claim 16. (original) A method of claim 14 or 15 wherein a hot zone of the igniter reaches at least about 1000°C within about one second of applying the current.

Claim 17. (previously presented) A heating apparatus comprising an igniter of claim 1.

Claim 18. (original) The apparatus of claim 17 wherein the apparatus is an instantaneous water heater.

Claim 19. (original) The apparatus of claim 17 wherein the apparatus is a cooking apparatus.

Claim 20. (cancelled)

Claim 21. (previously presented) The igniter of claim 1 wherein the booster zone path length is from about 0.1 to about 2 cm.

Claim 22. (previously presented) The igniter of claim 1 wherein the booster zone path length is from 0.2 to 1 cm.

Claim 23. (previously presented) The igniter of claim 1 wherein the igniter comprises a central heat sink zone.

Claim 24. (previously presented) The igniter of claim 23 wherein the igniter comprises a heat sink zone interposed between conductive, booster and hot zones of the igniter.

Claim 25. (new) The igniter of claim 1 wherein the igniter has a time-to-temperature value of 2 seconds or less.

Claim 26. (previously presented) A sintered ceramic igniter element comprising a conductive zone, a power booster zone, and a hot zone,
the booster zone having a PTCR and a resistivity greater than the conductive zone and less than the hot zone,
the hot zone having a resistivity greater than the booster zone,
wherein the hot zone path length is 2 cm or less;
the igniter has a time-to-temperature value of 3 seconds or less;
the room temperature resistance of the conductive zone is less than about 50 percent of the room temperature resistance of the booster zone; and
the room temperature resistance of the booster zone is less than about 70 percent of the room temperature resistance of the hot zone.

Claim 27. (previously presented) The igniter element of claim 26 wherein the igniter has a time-to-temperature value of 2 seconds or less.

Claim 28. (previously presented) The igniter element of claim 26 wherein the room temperature resistance of the conductive zone is about 10 percent or less than the room temperature resistance of the booster zone.

Claim 29. (currently amended) The igniter element of claim 26 wherein the room room-temperature resistance of the booster zone is about 50 percent or less than the room temperature resistance of the hot zone.

Claim 30. (new) The igniter element of claim 26 wherein the igniter is adapted for use at 6, 8, 10, 12 or 24 volts.

Claim 31. (new) A method for igniting gaseous fuel, comprising applying an electric current across an igniter of claim 26, wherein the current has a nominal voltage of 6, 8, 10, 12 or 24 volts.

Claim 32. (new) The method of claim 31 wherein the current has a nominal voltage of 24 volts.

Claim 33. (new) The method of claim 31 wherein a hot zone of the igniter reaches at least about 1000°C within about one second of applying the current.